

VERSATILE USER INTERFACE DEVICE AND ASSOCIATED SYSTEM

BACKGROUND OF THE INVENTION

Field of the Invention

- 5 [0001] The present invention generally relates to remote control devices and systems, and in particular to a versatile user interface device, such as a remote controller, suitable for use with a consumer device, such as a digital set-top terminal.

Description of Related Art

- 10 [0002] Over the past few decades, the availability of cable television (CATV) service to individual homes has increased dramatically. A number of different types of CATV communication systems have evolved to provide a broader array of CATV services. Conventional one-way CATV systems primarily provide video programming services, which are sent over the CATV physical link in a downstream direction, from the headend of a CATV system to a plurality of subscriber units.

- 15 [0003] Two-way CATV systems have become increasingly standard in the industry as the popularity and diversity of services or applications has grown, such as pay per view, interactive banking and home shopping. Two-way CATV system support both downstream and upstream communication. Accordingly, individual subscribers may communicate with the headend, other subscribers or service provider
20 within the system. These systems also permit subscribers to select specific video programming or consumer services and pay only for those services that are used.

- [0004] As digital set-top terminals become more of an application communication device, these set-tops enable various applications such as web browsing, video conferencing, games, home networking, device configuration, and the
25 like. Because each application program has its own user interface and menu requirements, the customization of the functions of the remote control device to these applications will greatly simplify the user interface experience, hence providing provide the consumer with a more user-friendly means of interacting with the application.

[0005] One approach to customizing the remote control functions is to increase the number of keys to accommodate the different applications. However, this approach becomes impractical as the number of favorite applications increases.

[0006] Another approach to customizing the remote control function is to download Infrared (IR) codes, while others place the key selection menu on the display screen enabling the user to manipulate the up/down keys to select one of the entries on the selection menu. Unfortunately, these approaches do not meet the level of customization needed by a given customer.

[0007] The present invention addresses the shortcomings of conventional remote control devices and the application specific real-time programmability of such devices.

SUMMARY OF THE INVENTION

[0008] One aspect of the invention is to provide a remote control system that is capable of application specific real-time programming of the remote control device.

[0009] Another aspect of the invention is to provide a versatile remote control system that incorporates Versatile Remote Control Manager (VRCM) software that is invoked by the application via user selection to enable application specific real-time re-mapping of the key code values for the operating keys of the remote control device.

[0010] Namely, the versatile remote control system is made up of a versatile remote control unit that interfaces with a set-top terminal. The set-top terminal includes a central processing unit, memory, radio frequency (RF) communication devices, audiovisual decoding devices, etc. One or more applications may be resident in the set-top terminal. The versatile remote control unit includes fixed and/or soft keys on a touch screen display for sending control signals to the central processing unit of the set-top terminal to invoke and control at least one such application. A Versatile Remote Control Manager (VRCM) is resident in the set-top terminal, wherein the VRCM and associated Application Programming Interface Routines (API's) enable several functions, among them enabling a given application to re-map keys to correspond to the functions assigned by that application based on what the user's frequent key selection sequences. In an exemplary embodiment, a given

application uses the VRCM and API's to designate an application specific function to a given key, or a series of key selections to a given key where these selections are frequently made by the user and the user instructs the application to perform this mapping. This mapping allows for subsequent application specific user interface interaction. In such an embodiment, each application maintains the new mapping and performs the associated functions according to the key selection.

[0011] For added user convenience, when the versatile remote control unit has an integrated display, a given application may use the VRCM and API's to download soft key graphical representations that are specific to the functions performed by this application and represent the individual key sequences that would otherwise have to be selected by the user for that specific function. These soft keys are displayed on the touch screen of the versatile remote control unit or a display device that is capable of facilitating similar remote control functionality.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] In the drawings:

[0013] FIG. 1 is a block diagram of a set-top terminal of the present invention; and

[0014] FIG. 2 is an external view of a versatile remote control unit for the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0015] Fig. 1 shows a block diagram of a consumer device 100, such as a set-top terminal (STT) in accordance with the invention. The SST 100 includes a central processing unit (CPU) 104 that interfaces with a system bus 112. The central processing unit 104 includes both volatile and non-volatile memory to store digital information. Although a set-top terminal is described in the exemplary embodiment of the invention, it will be appreciated that the invention can be practiced with other consumer devices, such as a satellite receiver, television, and the like.

[0016] As shown in Fig. 1, the set-top terminal 100 of the present invention includes a primary tuner 202. The primary tuner 202 is preferably a broadband tuner